

Water Trash Collector

Mr. Namdev Garad (Head of Chemical Department), Miss. Ashwini Kharde, Mr. Pratik Vidhate, Mr. Ajay Harde, Mr. Onkar Pujari, Mr. Sumit Parkhe

Padmashri. Dr. Vittalrao Vikhe Patil Collage of Technology & Polytechnic, loni Tal. Rahata Dist. Ahmednagar

Email: Pratik.r.vidhate@gmail.com

1. Abstract - In today day to day life, employing cutting-edge technology to streamline the approximately 71% of the Earth's surface is covered collection process. by water. Without affecting significant role that As it plays a major role in cleaning the water ponds, technology plays in our modern world, lakes, rivers and oceans by removing a trash without environmental and water resources face debris from harming the aquatic life it aimsto have a good future. various sources. It is crucial to harness existing technologies to safeguard and preserve water, In response to the escalating environmental challenges, addressing the urgent need for sustainable practices. the development of innovative technologies becomes To tackle this issue, innovative technologies have paramount. The semi- automatic waste trash collector's been proposed to contribute to the protection of prowess lies not only in its advanced features but also society and the environment. in its adaptability to diverse water bodies. It offers a scalable solution, addressing pollution concerns in both stagnant ponds and flowing rivers.

The proposed waste trash collector is a semi-automatic device designed to operate in stagnant ponds and rivers, collecting floating debris such as duckweed and plastic bottles. It integrates a programmable RC kit with a 1 km range, which allows for efficient and user-friendly control of the waste collection process. This unique combination of features enhances the efficiency of waste collection and simplifies the activation process, making it a convenient and accessible solution. The technology aims to address the specific challenges posed by floating waste in water bodies, contributing to the preservation of water resources and the protection of aquatic life. It offers a scalable solution, adaptable to diverse water bodies, and aims to contribute to the protection of society and the environment. The key objective of this technology is to address the specific challenges posed by floating waste in stagnant water bodies. Duckweed, a floating plant, can be detrimental to the survival of aquatic animals in ponds. Additionally, plastic bottles that accumulate on the water's surface contribute to environmental pollution. The proposed waste trash collector aims to mitigate these issues by

The pressing need to address water pollution and preserve water resources has led to the development of advanced technologies. The proposed waste trash collector, RC kit with 1 km range, represents a significant step forward in efficient and user-friendly waste collection. By leveraging existing technologies, we can actively contribute to safeguarding our environment and ensuring the well-being of aquatic ecosystems.

Index terms :- controller, Motors, Conveyor Belts, Battery, Motor Driver Controller.

2. Introduction:

Water pollution is a growing concern worldwide, with rivers, lakes, and oceans bearing the brunt of human activities. One of the significant contributors to this problem is the accumulation of trash in aquatic environments. Plastic bottles, wrappers, and other debris not only spoil the aesthetics of

these water bodies but also pose serious threats to aquatic life and ecosystems. In response to this environmental challenge, innovative solutions are emerging, and one such solution making waves is the Water Trash Collector.

Imagine a superhero for our waterways, diligently working to clean up the mess we humans have created. The Water Trash Collector is precisely that – a purpose-built device designed to float on the water's surface, actively collecting and removing floating debris. In simple terms, it's like a guardian for our aquatic environments, ensuring they stay clean and healthy for generations to come.

The design of the Water Trash Collector takes into consideration the unique challenges posed by water environments. It is buoyant, ensuring it stays afloat, and its structure is robust enough to withstand various weather conditions and water turbulence. The device is often equipped with solar-powered technology to enhance its sustainability, making it an eco-friendly solution for a persistent environmental problem.

The importance of the Water Trash Collector becomes even more evident when considering the impact of plastic and other debris on aquatic ecosystems. Marine life, from fish to birds, can mistake floating trash for food, leading to ingestion and, ultimately, harm. Moreover, the accumulation of debris can disrupt the natural flow of water, leading to blockages, increased flooding risks, and adverse effects on water quality.

By deploying Water Trash Collectors strategically, we address these issues at the source. These devices act as the first line of defense, intercepting and removing debris before it can wreak havoc on the delicate balance of aquatic ecosystems. It's a proactive

approach to preserving our waterways and the myriad forms of life that depend on them.

One of the remarkable features of the Water Trash Collector is its versatility. It can be customized to suit different environments, from slow-moving rivers to fast-flowing streams and calm lakes to turbulent coastal areas. The adaptability of these devices makes them scalable and applicable in various geographical locations, ensuring a more comprehensive approach to tackling water pollution globally.

In addition to their practical benefits, Water Trash Collectors contribute to raising awareness about the importance of responsible waste management. Seeing these devices in action serves as a visual reminder of the impact of our actions on the environment. It encourages communities to rethink their habits and adopt more sustainable practices to reduce the overall burden on our water bodies.

The integration of technology, such as sensors and data collection capabilities, further enhances the effectiveness of Water Trash Collectors. These features allow for real-time monitoring of water quality and the efficiency of the collectors.

As we navigate the challenges of the 21st century, the Water Trash Collector stands as a symbol of human ingenuity and our capacity to address environmental issues. It reminds us that, with the right technologies and a collective commitment to sustainability, we can reverse the tide of pollution and create a cleaner, healthier planet.

The Water Trash Collector is a beacon of hope in the battle against water pollution. Its simple yet effective design, coupled with its adaptability and technological enhancements, makes it a valuable tool in preserving the

integrity of our waterways. By investing in and embracing such innovative solutions, we take a significant step towards a future where clean water is not just a necessity but a reality for all living beings. The Water Trash Collector invites us to rethink our relationship with the environment and inspires us to become better stewards of the precious resources that sustain life on Earth.

3 Components Used

1. DC Gear Motor
2. Transmitter & Receiver
3. Speed Controller
4. Battery
5. PVC Foam Sheet
6. Wheels
7. Conveyor Belt

1) DC Gear Motor:



12v DC Gear motor

A 12V DC gear motor is a versatile electromechanical device commonly used in a wide range of applications. Operating on a 12-volt direct current power supply, these motors feature built-in gears that enable speed reduction and torque amplification. This makes them ideal for tasks requiring precise control over rotational speed and increased torque output. From robotics and automotive systems to industrial machinery and home appliances, 12V DC gear motors play a crucial role in powering various mechanisms efficiently and reliably. Their compact size, high efficiency, and compatibility with

different control methods make them popular choices in diverse engineering and DIY projects.

2) Transmitter & Receiver:



Transmitter & Receiver

The Flysky CT6B Transmitter and Receiver is a popular choice among RC enthusiasts for its reliability and versatility. With its 2.4GHz frequency and six-channel functionality, it provides precise and responsive control over remote-controlled vehicles and aircraft. The transmitter features a user-friendly interface with programmable functions and LCD display, allowing for easy customization and monitoring of settings. The receiver, compact in size, offers stable signal reception and seamless communication with the transmitter. Whether used for hobbyist projects or professional applications, the Flysky CT6B Transmitter and Receiver system delivers exceptional performance and functionality, making it a preferred option for RC enthusiasts worldwide.

3) Speed Controller:



Brushed Motor Speed Controller

The Brushed Motor Speed Controller ESC 20A is a crucial component in remote-controlled vehicles and robotics. With a current rating of 20A, it regulates the speed and direction of brushed DC motors. Compact and lightweight, it's easy to install and offers features like pulse-width modulation (PWM) control and battery voltage cutoff protection for reliable performance in various applications.

4) Battery:



Battery

Capacity: A 1100mAh lithium-ion battery can store up to 1100 milliampere-hours of electrical charge.

Voltage: Typically, lithium-ion batteries have a nominal voltage of 3.7 volts.

Lightweight: Lithium-ion batteries are known for their high energy density, making them lightweight and suitable for portable electronic devices.

Rechargeable: These batteries are rechargeable, allowing for multiple cycles of use before needing replacement.

Common Applications: Used in various electronic devices such as smartphones, digital cameras, portable gaming consoles, and other gadgets requiring a reliable power source.

Compact Size: 1100mAh lithium-ion batteries are available in compact sizes, making them suitable for devices with limited space.

5) PVC Foam Sheet:

PVC foam sheets are lightweight, durable, and waterproof, making them ideal for constructing the body of a water trash collector. These sheets can be easily shaped, cut, and molded to create the desired structure for the collector's floatation body. Their resistance to water damage ensures longevity and reliability in aquatic environments. Additionally, PVC foam sheets offer buoyancy, allowing the collector to float efficiently on the water's surface while effectively collecting debris. Their versatility makes them a practical choice for building a robust and functional water trash collector body.

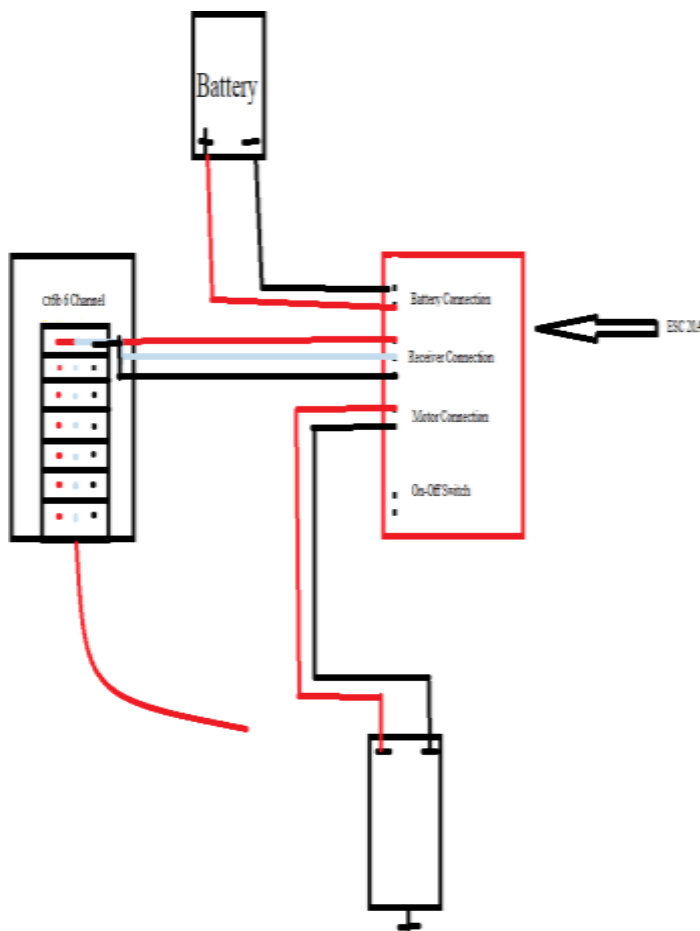
6) Wheels:



7) Conveyor Belt:

The water trash collector's conveyor belt is like a big moving platform underwater. It quietly scoops up trash floating in the water, like bottles and wrappers, and carries them away. It helps keep our oceans and rivers clean by taking away the garbage that can harm animals and the environment.

4. Circuit Diagram:



Circuit Diagram

5. Working

The water trash collector uses a CT6B receiver and transmitter system to receive signals and control its movements underwater. Powered by a 12V gear model, it propels forward efficiently. A 20A ESC (Electronic Speed Controller) regulates its speed. The belt gear

mechanism enables it to collect trash effectively, while the PVC foam sheet helps it float and maintain buoyancy. Together, these components work in harmony, allowing the collector to navigate water bodies, gather debris, and contribute to keeping our aquatic environments clean.

The CT6B receiver and transmitter communicate commands to the water trash collector, guiding its movements underwater. Powered by a 12V gear model, it moves forward steadily, while the 20A ESC regulates its speed, ensuring smooth operation. The belt gear system efficiently gathers trash floating on the water's surface, while the PVC foam sheet provides buoyancy, keeping the collector afloat. This integrated setup enables the collector to effectively remove debris, safeguarding marine life and preserving the health of our waterways.

6. Principal

At its core, the Water Trash Collector operates on a straightforward principle – prevention is better than cure. By strategically placing these devices in water bodies, we can stop trash from spreading further, preventing it from causing more significant harm. The collector consists of a floating platform equipped with a specialized net or barrier designed to trap and collect debris as it moves with the water currents.

Working principal:

- 1). Gear Motors
- 2). Battery
- 3). Conveyor Belt
- 4). Remote Control (transmitter)
- 5). Receiver Board
- 6). Transmitter
- 7). Waste Bin

7. Methodology

The methodology for our water trash collector project involves a systematic approach to combat the pervasive issue of water pollution in rivers, ponds, lakes, and oceans. First and foremost, we conduct a thorough survey to identify areas with significant pollution problems, focusing on those where floating debris poses a particular threat to aquatic life. Following this, we design a floating platform equipped with a robust net or barrier, capable of effectively trapping and collecting debris as it moves with the water currents. Strategic placement is crucial, and we determine optimal locations based on careful consideration of water flow patterns and pollution hotspots. The installation process involves securely anchoring the floating platforms to ensure stability and longevity.

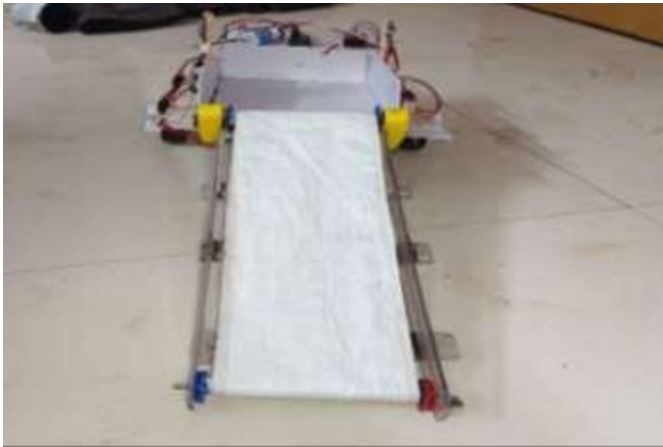
To enhance sustainability, we integrate an automatic debris collection system into the platform, utilizing mechanisms such as conveyors or nets. Additionally, we explore the use of solar panels to power the collector, aligning with eco-friendly practices. Regular monitoring is essential to assess the amount of collected debris, and routine maintenance is scheduled to address any issues and optimize performance. Concurrently, community awareness campaigns play a pivotal role in educating local residents about the detrimental effects of water pollution and the significant role our trash collector can play in mitigating these issues.

Furthermore, data analysis is conducted to evaluate the effectiveness of the water trash collector in reducing pollution levels over time. Continuous feedback from the community is sought to understand the real-world impact of our initiative, and necessary improvements are implemented accordingly. Collaborating with local authorities,

environmental organizations, and communities is integral to garnering support and ensuring the sustained success of our water trash collector project. Through this comprehensive methodology, we aim not only to address the immediate problem of floating debris but also to foster a long-term commitment to environmental stewardship within the communities we serve.\

8. Results





in vulnerable water bodies, we intercept & capture floating debris before it can inflict irreparable harm on marine life ecosystems.

Versatility is a key strength of the Water Trash Collector, allowing it to adapt to diverse environments, from serene lakes to turbulent coastal waters. This adaptability ensures that this technology can be employed globally, making it a scalable solution for addressing water pollution on a large scale. It becomes a tangible manifestation of our commitment to environmental stewardship, transcending geographical boundaries and bringing communities together in the pursuit of cleaner waterways.

The incorporation of solar-powered technology and data-driven monitoring enhances the sustainability and efficiency of Water Trash Collectors. Harnessing the power of the sun not only reduces the environmental footprint of these devices but also ensures their continuous operation, even in remote locations. Real-time data collection provides valuable insights into the types and amounts of debris intercepted, enabling informed decision-making for targeted interventions and waste management strategies.

Moreover, the presence of Water Trash Collectors serves as a powerful educational tool, raising awareness about the consequences of irresponsible waste disposal. Seeing these devices in action prompts communities to reevaluate their habits and adopt more sustainable practices. It fosters a sense of responsibility and environmental consciousness, encouraging individuals to play an active role in preserving the health of our water bodies.

As we embrace the Water Trash Collector and similar innovations, we embark on a journey toward a future where clean water is not a

10. Conclusion

In conclusion, the Water Trash Collector emerges as a beacon of hope and a practical solution in our collective efforts to combat water pollution. This innovative device, resembling a superhero for our waterways, showcases the power of human ingenuity and determination to address the environmental challenges that threaten the health of our aquatic ecosystems.

The pressing issue of water pollution, exacerbated by the accumulation of plastic and other debris, demands proactive solutions. The Water Trash Collector represents a paradigm shift in our approach, moving beyond conventional cleanup methods to a more preventive strategy. By placing these devices

luxury but a fundamental right. This technology invites us to reevaluate our relationship with the environment, urging us to prioritize sustainable practices and responsible consumption. It symbolizes a collaborative effort to create a world where waterways remain pristine, supporting diverse ecosystems and ensuring the well-being of present Aquatic life.

Save the Oceans" by Charles
Moore and Cassandra Phillips

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